

December 8, 1965

Dr. Lloyd V. Berkner
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Dear Lloyd:

I appreciate your sending me the advance copy The Rise of Oxygen in the Earth's Atmosphere with Notes on the Martian Atmosphere.

You will excuse the pun of my calling it a model of breath-taking sweep. I have no penetrating criticisms but I am sure it will lead to healthy controversy and refinement.

I could make a few incidental by-remarks.

1. Oxygen as a universal poison? Possibly not in an iron-rich milieu. I.E. catalase evolved as a more efficient iron salt as the bugs crawled away from their iron oxide sheaths.
2. Chemosynthesis needs reducing atmosphere. Have we exhausted all possible processes? Urey-Miller might be a red herring. May I again (see my paper on "Moondust" in Science) bring up the primitive aggregation?
3. Carl Sagan will probably challenge on exosphere vs. atmospheric temperatures in re escape rates from Mars. But I would stress with you that low surface temperatures mean impeded outgassing from Mars' crust. I.E., I agree with you that most of Mars' C has never been baked out.
4. 10 meters is not such a shallow pool. But why such a depth? Iron again (!This time as a powerful uv filter).
5. While Earth is consistent with it, I can't accept the generalization that multicellularity demands oxygen.

Sincerely yours,

Joshua Lederberg,
Professor of Genetics

JL:eif